Suisun Marsh Monitoring Program
Channel Water Salinity Report

Reporting Period: November 2006

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1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT

As per SWRCB Water Rights Decision 1641, dated December 29, 1999, and previous SWRCB decisions, the California Department of Water Resources (DWR) is required to provide monthly channel water salinity compliance reports for the Suisun Marsh to the SWRCB. Conditions of channel water salinity in the Suisun Marsh are determined by monitoring specific electrical conductivity, which is referred as "specific conductance" (SC). The locations of all listed stations are shown in Figure 5.

The monthly reports are submitted for October through May each year in accordance with SWRCB requirements. The reports are required to include salinity data from the stations listed below to ensure salinity standards are met to protect habitat for waterfowl in managed wetlands:

Station Identification	Station Name	General Location	Classification
C-2*	Collinsville	Western Delta	Compliance Station
S-64	National Steel	Eastern Suisun Marsh	Compliance Station
S-49	Beldon's Landing	North-Central Suisun Marsh	Compliance Station
S-42	Volanti	North-Western Suisun Marsh	Compliance Station
S-21	Sunrise	North-Western Suisun Marsh	Compliance Station

Data from the stations listed below are included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh.

Station Identification	Station Name	General Location	Classification
S-97	Ibis	Western Suisun Marsh	Monitoring Station
S-35	Morrow Island	South-Western Suisun Marsh	Monitoring Station

Information on Delta outflow, area rainfall, and operation of the Suisun Marsh Salinity Control Gates are also included in the monthly reports to provide information on conditions that may affect channel water salinity in the Marsh.

* Throughout the report, the representative data from nearby USBR station is used in lieu of data from station C-2.

2. Monitoring Results

2.1 Channel Water Salinity Compliance

During the month of November, 2006, salinity conditions at all five compliance stations are in compliance with channel water salinity standards of SWRCB (Table 1). Compliance with standards for the month of November was determined for each compliance station by comparing the progressive daily mean of high-tide SC with respective standards. During November, the standard for compliance stations C-2, S-64, S-49 were 15.5 mS/cm and for S-42 and S-21, 16.5 mS/cm. Table 1 lists monthly mean high-tide SC at these compliance stations. The progressive daily mean (PDM) is the monthly average of both daily high-tide SC values. The mathematical equation is shown below.

$$\text{PDM} = \frac{\sum \text{daily average of high tide SC}}{\text{\# days of the month}}$$

2.2 Delta Outflow

Outflow for November 2006 started off below 4,000 cfs and then fluctuated between 2,800 cfs and 5,500 cfs before peaking to a high of about 9,000 cfs in mid-November as result of precipitation events. Thereafter, outflow decreased to about 4,000 cfs until late November where a few more precipitation events led outflow to end around 6,000 cfs. The monthly Delta outflow is represented by the mean Net Delta Outflow Index (NDOI). The NDOI is the estimated daily average of Delta outflow. Mean NDOI for November 2006 is listed below:

Month	Mean NDOI (cubic feet per second)
November	5,157

2.3 Rainfall

There were more rainfall activities in November than in previous month. Rainfall occurrences were observed in the early, mid, and late November. The largest daily rainfall total of the month was 0.66 inches, but most of the rainfall events occurred more often in mid-November. The monthly total is shown below.

Month	Total Rainfall (inches)
November	2.55

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock installations at the SMSCG during November 2006 is summarized below.

Date	Gate status	Flashboards status	Boat Lock status
November 1 – 30	Open	Out	Closed

There were no needs of SMSCG operation for the month of November because salinity levels throughout the marsh was not of concern. However, DWR will continue to monitor salinity levels in the marsh and will operate the gates and install the flashboards if conditions warrant.

3. Discussion

3.1 Factors Affecting Channel Water Salinity in the Suisun Marsh

Factors that affect channel water salinity levels in the Suisun Marsh include:

- delta outflow;
- tidal exchange;
- rainfall and local creek inflow;
- managed wetland operations; and,
- operation of the SMSCG and flashboard configurations.

3.2 Observations and Trends

3.2.1 Conditions during the Reporting Period

During November 2006 PDM salinity levels at Collinsville(C-2), National Steel(S-64), Beldons (S-49), and Volanti(S-42) were all below 14.0 mS/cm as shown in Figure 1. There were no significant salinity levels changes. The only minor change in salinity levels occurred in early November. Thereafter, salinity levels at all compliance stations during November were essentially flat line. Similar observation in salinity levels and patterns are also seen at the two monitoring stations, S35 and S97.

Overall, salinity levels in November 2006 were below standards at all compliance and monitoring stations.

S-21 (Sunrise Club) continues to be out of service since late December 2005 due to flooded event, thus S-21 station will not be reported in future reports until further notice. The SWRCB has granted DWR to continue using S42 as a surrogate station for S21 during the 2006-2007 control season while repair work is being done at S21 site.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance and monitoring stations for November 2006 were compared with means for those months during the previous nine years (Figure 4).

Mean salinity pattern of all compliance and monitoring stations resembles that of 1999, but higher in magnitude, except for C-2 and S35. Compared to previous nine years, November 2006 salinity levels were ranked first in high Specific Conductance, thus making it the month with the last lowest salinity levels.

Table 1

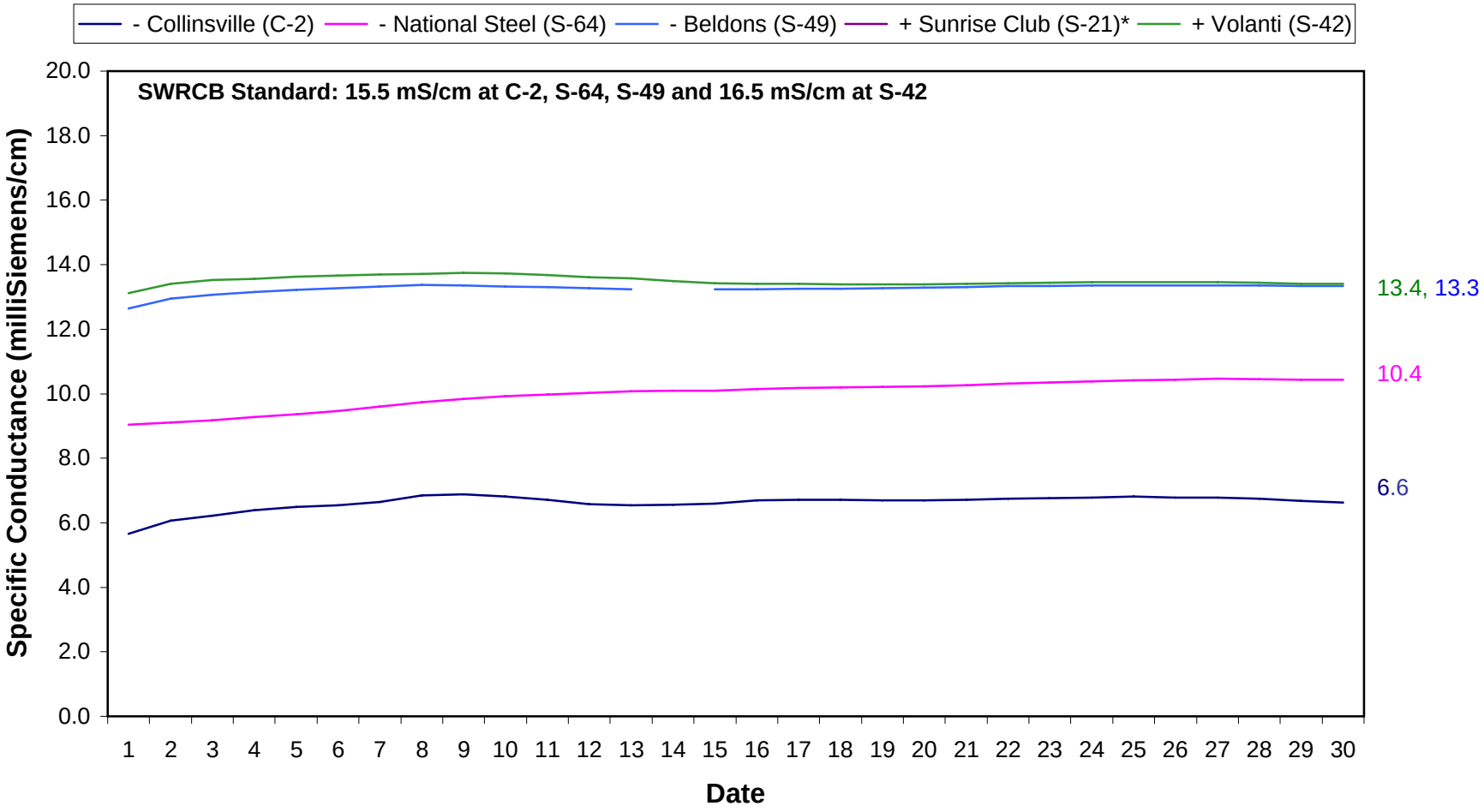
Monthly Mean High Tide Specific Conductance at Suisun Marsh Water Quality Compliance Stations

November 2006

Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2**	6.6	15.5	Yes
S-64	10.4	15.5	Yes
S-49	13.3	15.5	Yes
S-42****	13.5	16.5	Yes
S-21***	n/a	n/a	n/a

*milliSiemens per centimeter
**The representative data from nearby USBR station is used in lieu of data from station C-2.
***station is temporarily out of service. The SWRCB has granted DWR to continue using S42 as a surrogate station for S21 during the 2006-2007 control season.
****S42 value is not representative since it contains missing data, but the number of missing data is not enough to alter the end of month pdm value.

Figure 1 - Suisun Marsh Progressive Mean High-Tide Specific Conductance for November 2006



*S21 station is temporarily out of service for flood repair work.

Figure 2. Suisun Marsh Progressive Mean High-Tide Specific Conductance at Monitoring Stations S35 and S97 November 2006

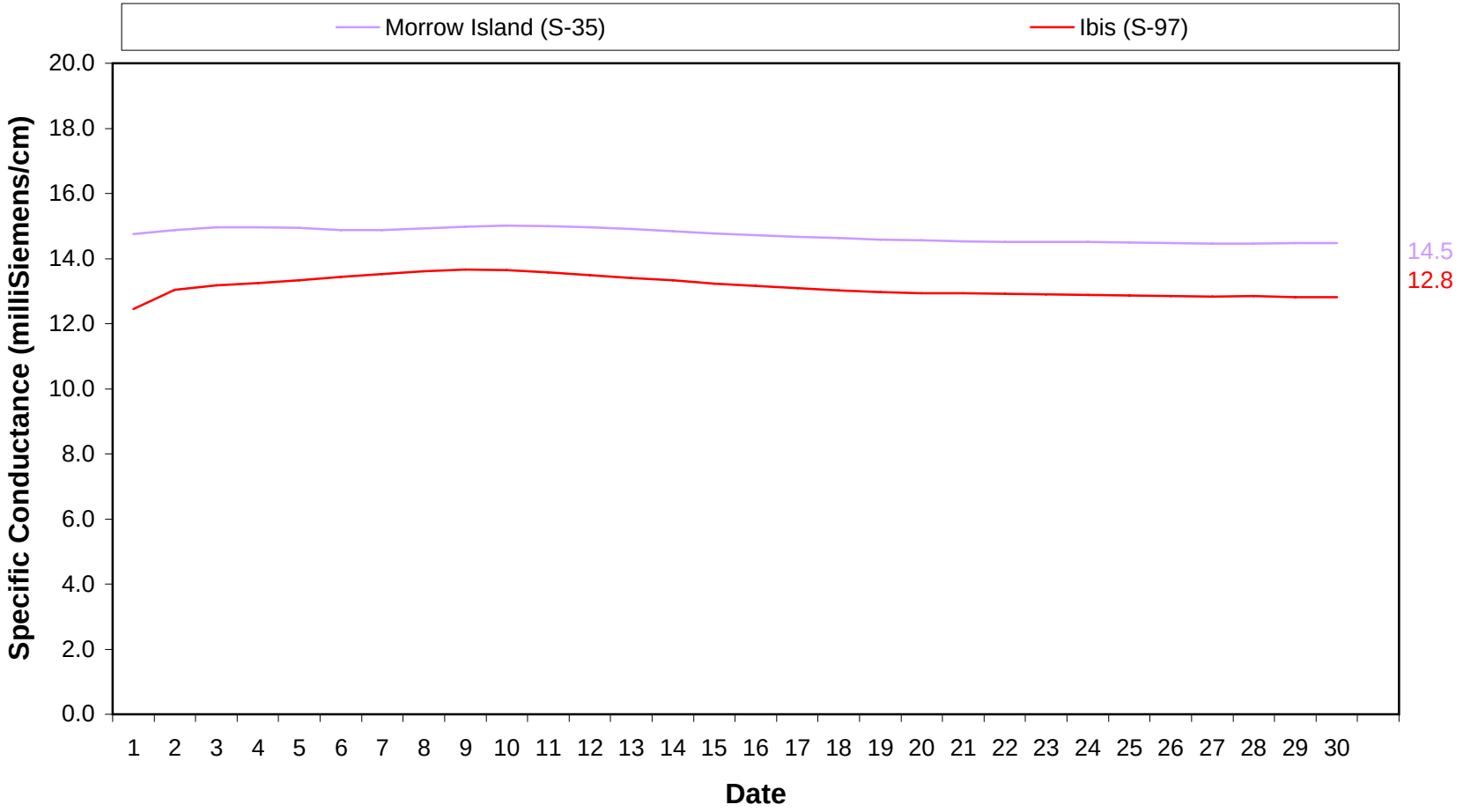
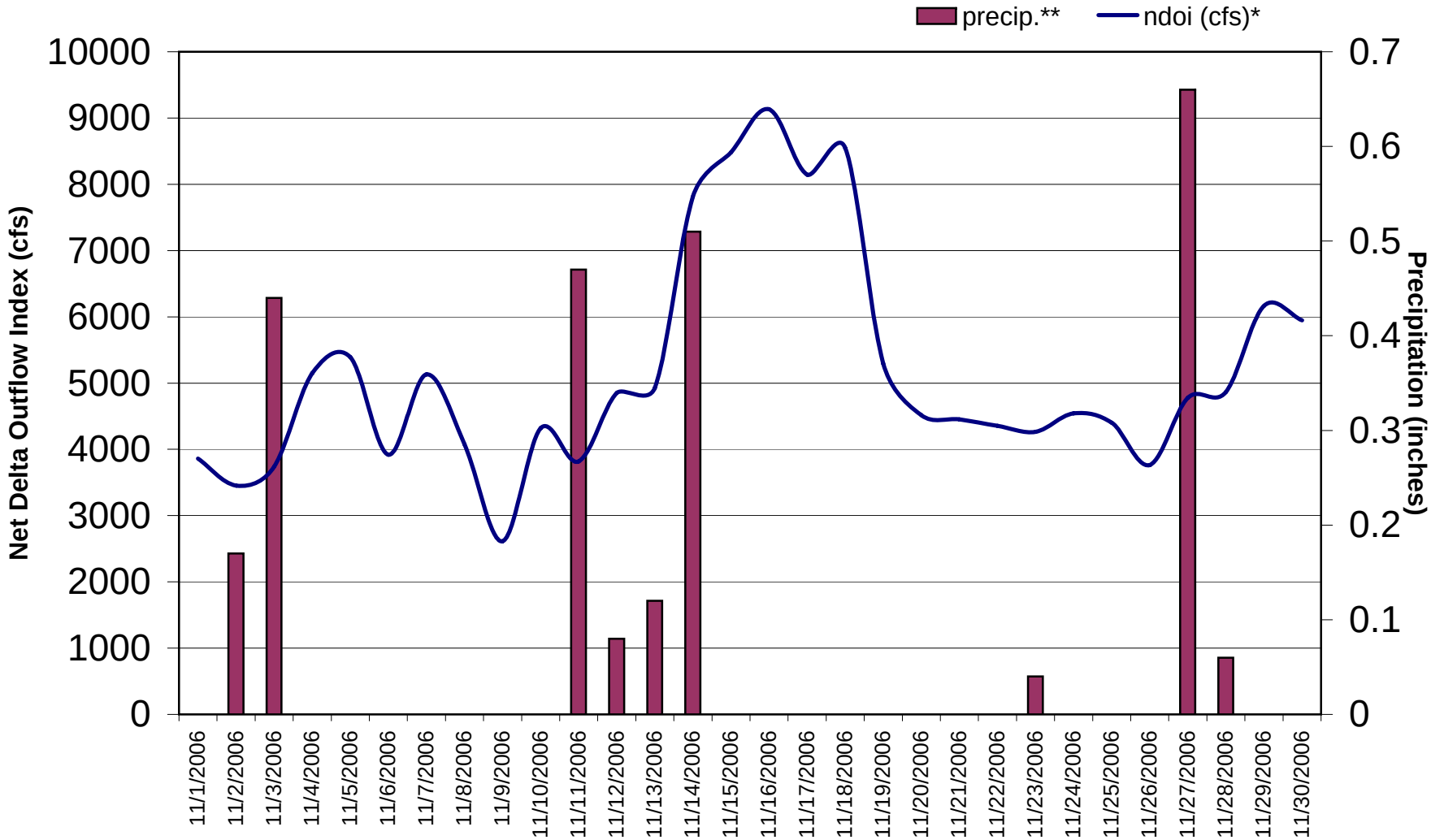
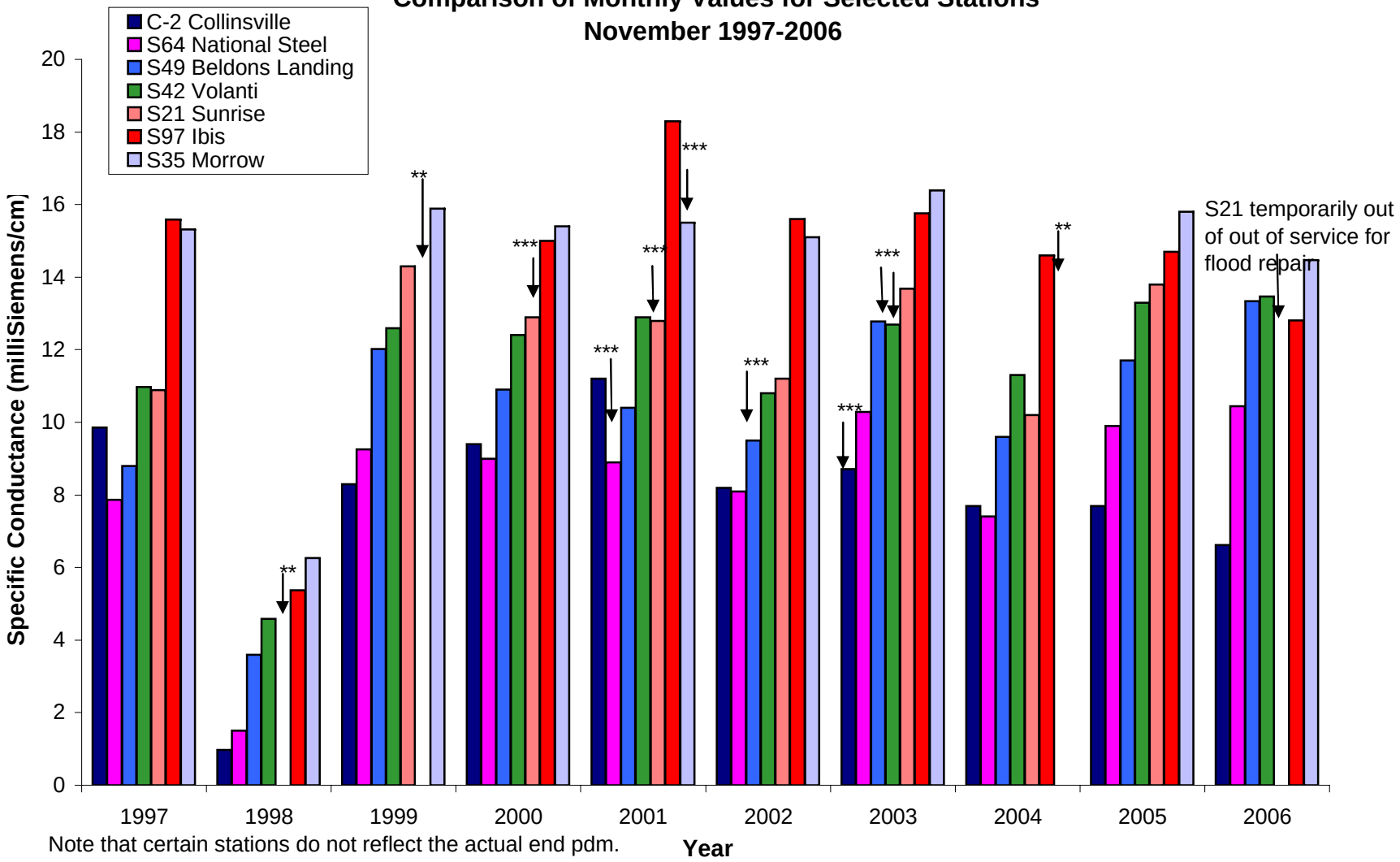


Figure 3. Daily Net Delta Outflow Index and Precipitation
November 2006

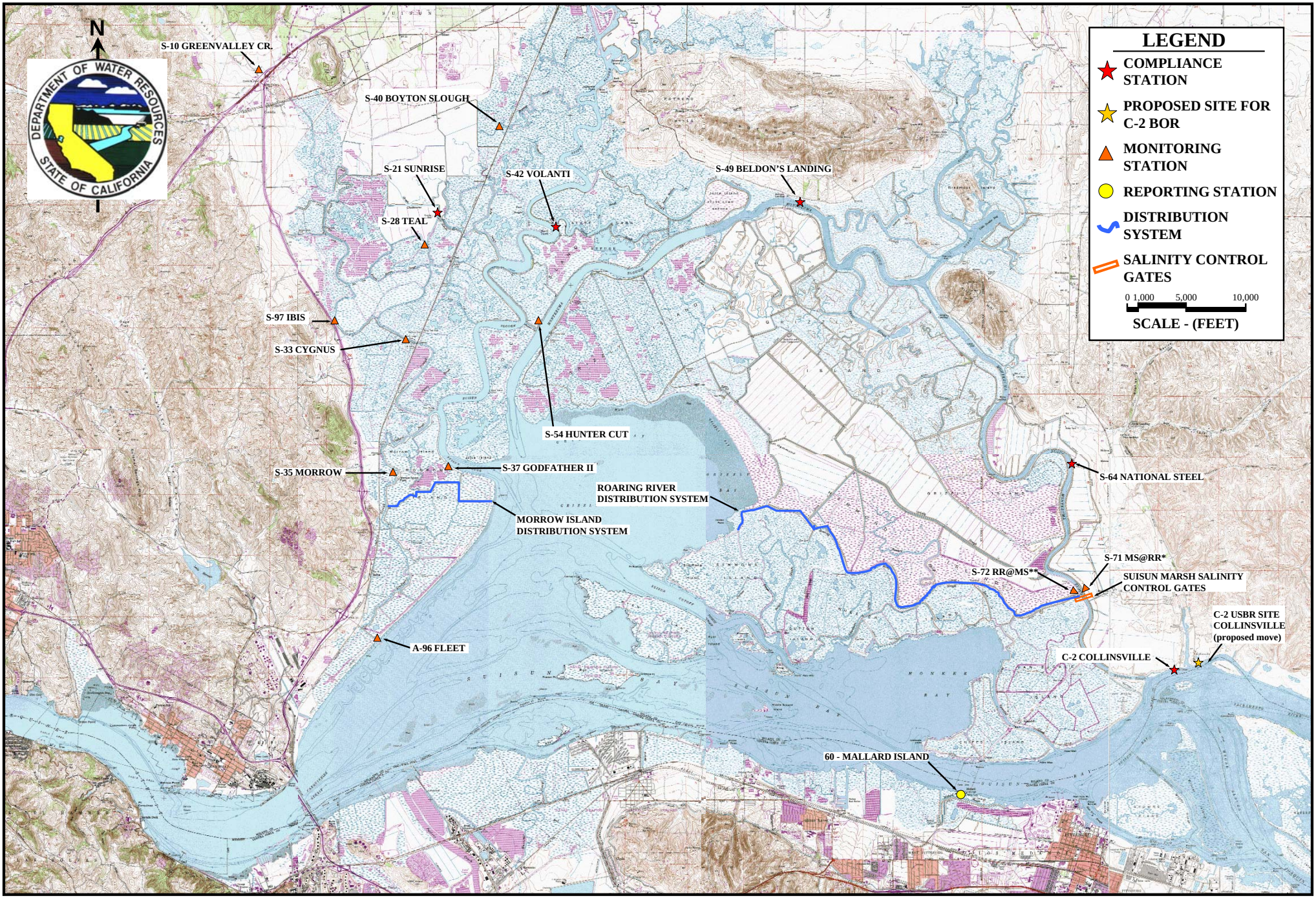


*Preliminary DWR, O&M data
**Precipitation data from Fairfield Treatment Plant

Figure 4. Monthly Mean Specific Conductance at High Tide: Comparison of Monthly Values for Selected Stations November 1997-2006



Note that certain stations do not reflect the actual end pdm.
** Data was not obtained due to powder problems at the station.
*** Some data not obtained due to equipment malfunction.



SUISUN MARSH PROGRAM WATER QUALITY MONITORING AND CONTROL FACILITIES